



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,227	07/08/2003	Yoshiaki Tanida	030823	6141
38834	7590	08/11/2004	EXAMINER	
WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036			LEWIS, MONICA	
			ART UNIT	PAPER NUMBER
			2822	

DATE MAILED: 08/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/614,227	TANIDA ET AL.	
	Examiner	Art Unit	
	Monica Lewis	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 15-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to the election filed May 27, 2004.

Election/Restrictions

2. Applicant's election without traverse of Group I and Embodiment I in the reply filed on 5/27/04 is acknowledged.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
4. The disclosure is objected to because of the following informalities: a) it is incorrectly stated that A1 is a group V element (See Page 13 Lines 12-14).

Appropriate correction is required.

Drawings

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: a) 15 (See Figure 5). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be

Art Unit: 2822

notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

6. Claim 3 is objected to because of the following informalities: a) “fist” appears to be a spelling error. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 presently recites that the first element is “either of a III group element **and** a V group element.” However, it is unclear what the scope of the claim is since typically “either” is used with “or” and not with “and.” Furthermore, it is noted that in the examples set forth in the specification, the intermediate layer can comprise both a group III element (Al) and a group V element (Ta) (See Page 7 Lines 18-24 and Page 10 Lines 4-7). Additionally, the scope of claims 4 and 14 is unclear because of the use of “and/or.” Finally, claims 2, 3 and 5-13 depend directly or indirectly from a rejected claim and are, therefore, also rejected under 35 U.S.C. 112, second paragraph for the reasons set above.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

10. Claims 1-12, as far as understood, are rejected under 35 U.S.C. 102(a) as being anticipated by Yamamoto (U.S. Publication No. 2002/0153579).

In regards to claim 1, Yamamoto discloses the following:

a) an intermediate layer (3) formed on a semiconductor substrate (1), the intermediate layer being formed of an oxide containing a first element which is either of a group III element or a group V element (For Example: See Figure 1); and

b) an insulation film (4) formed on the intermediate layer, the insulation film being formed of an oxide of a second element which is the other of the group III element or the group V element (For Example: See Figure 1); and

c) an electrode (5a) formed on the insulation film (For Example: See Figure 1).

In regards to claim 2, Yamamoto discloses the following:

a) another intermediate layer (6) formed between the insulation film and the electrode, said another intermediate layer being formed of an oxide containing the first element (For Example: See Figure 3).

In regards to claim 3, Yamamoto discloses the following:

a) the intermediate layer is formed of an oxide containing the first element and the second element (For Example: See Paragraph 19 and 22).

In regards to claim 4, Yamamoto discloses the following:

a) the intermediate layer and/or said another intermediate layer is formed of an oxide containing the first element and the second element (For Example: See Paragraph 19 and 22).

Art Unit: 2822

In regards to claims 5 and 6, Yamamoto discloses the following:

a) the insulation film has a thickness of 5 nm or below (For Example: See Paragraph 102).

In regards to claims 7 and 8, Yamamoto discloses the following:

a) the second element is Al, Sc, Y or La (For Example: See Paragraph 19 and 22).

In regards to claims 9 and 10, Yamamoto discloses the following:

a) the insulation film is an Al_2O_3 film, Sc_2O_3 film, Y_2O_3 film or La_2O_3 film (For Example: See Paragraph 19 and 22).

In regards to claims 11 and 12, Yamamoto discloses the following:

a) the first element is Ta, V, Nb, Th or U (For Example: See Paragraph 19 and 22).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 13 and 14, as far as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (U.S. Publication No. 2002/0153579) in view of Wallace et al. (U.S. Patent No. 6,013,553).

In regards to claims 13 and 14, Yamamoto fails to disclose the following:

a) wherein the intermediate layer and/or said another intermediate layer further contains nitrogen.

However, Wallace et al. ("Wallace") discloses the use of the intermediate layer and/or said another intermediate layer further contains nitrogen (For Example: See

Art Unit: 2822

Paragraph 40). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor of Yamamoto to include the use of the intermediate layer and/or said another intermediate layer further contains nitrogen as disclosed in Wallace because it aids in providing high permittivity (For Example: See Column 2 Lines 29-67 and Column 3 Lines 1-35).

Additionally, since Yamamoto and Wallace are both from the same field of endeavor, the purpose disclosed by Wallace would have been recognized in the pertinent art of Yamamoto.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 571-272-1838. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722 for regular and after final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956

ML

August 5, 2004



Mary Wilczewski
Primary Examiner